Listeriosis

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Listeriosis is caused by the bacterium *Listeria monocytogenes*.

B. Clinical Description

Listeriosis is typically manifested as meningoencephalitis or bacteremia in newborns and adults. It may cause fever and abortion in pregnant women. Symptoms of meningoencephalitis include fever, headache, stiff neck, nausea and vomiting. The onset may be sudden or, in the elderly and in those who are immunocompromised, it may be more gradual. Delirium and coma may occur. Newborns, the elderly, immunocompromised persons, and pregnant women are most at risk for severe symptoms. Infections in healthy persons may only amount to a mild flu-like illness. The case-fatality rate in infected newborn infants is about 30%.

C. Reservoirs

Reservoirs for *L. monocytogenes* are soil, water, silage, mammals and fowl.

D. Modes of Transmission

L. monocytogenes may be acquired by the fetus *in utero* or during delivery. Listeria can also be transmitted through ingestion of contaminated foods or through contact with infected animals or birds. Person-to-person transmission has also been reported in nosocomial outbreaks of listeriosis.

E. Incubation Period

A range of 3 to 70 days has been reported, with a median incubation period of about 21 days.

F. Period of Communicability or Infectious Period

Although *L. monocytogenes* may be shed for months in the stool of infected persons, person-to-person transmission is rare. Following delivery, mothers of infected newborns may shed *L. monocytogenes* for 7 to 10 days in vaginal secretions or urine.

G. Epidemiology

Listeria are widely distributed in nature. Most cases of human listeriosis are believed to occur sporadically, but foodborne and nosocomial outbreaks have been documented. Foods associated with infection include unpasteurized milk, soft cheeses, processed meats and contaminated vegetables. Newborns, the elderly, immunocompromised persons and pregnant women are at greater risk of infection. About 30% of diagnosed cases occur within the first 3 weeks of life.

2) REPORTING CRITERIA AND LABORATORY TESTING SERVICES

A. What to Report to the Massachusetts Department of Public Health

- The isolation of *L. monocytogenes* from a normally sterile site (*e.g.*, blood or cerebrospinal fluid or, less commonly, joint, pleural, or pericardial fluid).

Note: See Section 3) C below for information on how to report a case.

B. Laboratory Testing Services Available

The Massachusetts State Laboratory Institute (SLI), Reference Laboratory can confirm the identification of *L. monocytogenes* in blood and cerebrospinal fluid. Additionally, the Reference Laboratory requests that all

laboratories submit *all* isolates for further identification to aid in the public health surveillance necessary for this illness. For more information call the Reference Laboratory at (617) 983-6607.

The SLI, Food Microbiology Laboratory (617-983-6616) will test implicated food items from a cluster or outbreak. See Section 4) D, Environmental Measures, for more information.

3) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To track the occurrence of listeriosis so that sources of major public health concern (*e.g.,* food sources) may be identified and control measures initiated.

B. Laboratory and Healthcare Provider Reporting Requirements

Refer to the lists of reportable diseases (at the end of this manual's Introduction) for information.

C. Local Board of Health Reporting and Follow-Up Responsibilities

1. **Reporting Requirements**

Massachusetts Department of Public Health (MDPH) regulations (*105 CMR 300.000*) stipulate that each local board of health (LBOH) must report the occurrence of any case of listeriosis, as defined by the reporting criteria in Section 2) A. Current requirements are that cases be reported to the MDPH Division of Epidemiology and Immunization, Surveillance Program using an official MDPH *Listeriosis Case Report* form (in Appendix A). Refer to the *Local Board of Health Reporting Timeline* (at the end of this manual's introductory section) for information on prioritization and timeliness requirements of reporting and case investigation.

2. **Case Investigation**

a. It is the LBOH responsibility to complete a *Listeriosis Case Report* form (in Appendix A) by interviewing the case and others who may be able to provide pertinent information. Much of the information required on the form can be obtained from the case's healthcare provider or the medical record.

b. Use the following guidelines to assist you in completing the form:
   1) Accurately record the demographic information, occupation (if applicable), date reported to your office, date investigation started and date of diagnosis.
   2) Record the clinical information.
   3) Indicate the type of infection caused by *Listeria monocytogenes*.
   4) Indicate the type of specimen from which *Listeria* was isolated, the type of lab test used, and date the first positive culture was obtained. If other lab tests were used diagnostically (e.g., bacterial antigen screen) please indicate the type of test(s) used and date(s) tested.
   5) If the case was diagnosed while pregnant or within 2 weeks of delivery, indicate outcome of pregnancy and associated dates. If the case is a newborn, complete the newborn section.
   6) Complete the exposure history section. Ask the case about suspect food items consumed and contact with livestock during the 3 weeks prior to illness.
   7) If you suspect that the case became infected through food, use of the MDPH *Foodborne Illness Complaint Worksheet* (Appendix A) will facilitate recording additional information. Record any restaurants at which the case ate suspect food(s), including food item(s) and date(s) consumed. It is requested that LBOHs fax or send this worksheet to the MDPH Division of Food and Drugs (see top of worksheet for fax number and address). This information is entered into a database to help link other complaints from neighboring towns, thus helping to identify foodborne illness outbreaks. *This worksheet does not replace the Listeriosis Case Report form.*

c. After completing the case report form, attach lab report(s) and mail (in an envelope marked "Confidential") to the MDPH Division of Epidemiology and Immunization, Surveillance Program. The mailing address is:

MDPH, Division of Epidemiology and Immunization
Surveillance Program, Room 241
305 South Street
Jamaica Plain, MA 02130

d. If you have made several attempts to obtain case information, but have been unsuccessful (*e.g.*, the case or healthcare provider does not return your calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), please fill out the form with as much information as you have gathered. Please note on the form the reason why it could not be filled out completely.

e. Institution of disease control measures is an integral part of case investigation. It is the LBOH responsibility to understand, and, if necessary, institute the control guidelines listed below in Section 4), Controlling Further Spread.

4) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements (*105 CMR 300.200*)

None.

B. Protection of Contacts of a Case

None.

C. Managing Special Situations

Reported Incidence Is Higher than Usual/Outbreak Suspected

If the number of reported cases of listeriosis in your city/town is higher than usual, or if you suspect an outbreak, investigate to determine the source of infection and mode of transmission. A common vehicle, such as food, should be sought and applicable preventive or control measures should be instituted. Consult with the epidemiologist on-call at the Division of Epidemiology and Immunization at (617) 983-6800 or (888) 658-2850**.** The Division can help determine a course of action to prevent further cases and can perform surveillance for cases across town lines and therefore be difficult to identify at a local level.

Note: Refer to the MDPH's *Foodborne Illness Investigation and Control Reference Manual* for comprehensive information on investigating foodborne illness complaints and outbreaks. (Copies of this manual were distributed to local boards of health in 1997–98. It can also be located on the MDPH website in PDF format at <http://www.magnet.state.ma.us/dph/fpp/refman.htm>.)

Multi-State Clusters

The Centers for Disease Control and Prevention (CDC) is working to identify and analyze multistate clusters of *Listeria*. Cases which may be part of such clusters will require additional follow-up and data collection from local health departments. Directions on follow-up activities for such situations will be provided by Division of Epidemiology and Immunization staff on a case-by-case basis.

D. Preventive Measures

Environmental Measures

Implicated food items must be removed from the environment. A decision about testing implicated food items can be made in consultation with the Division of Food and Drugs (DFD) or the Division of Epidemiology and Immunization. DFD can help coordinate pickup and testing of food samples. If a commercial product is suspected, DFD will coordinate follow-up with relevant outside agencies. DFD is reachable at (617) 983-6712.

Note: The role of the DFD is to provide policy and technical assistance with the environmental investigation such as interpreting the Massachusetts Food Code, conducting a HACCP risk assessment, initiating enforcement actions and collecting food samples.

The general policy of the SLI is only to test food samples implicated in suspected outbreaks, not single cases (except when botulism is suspected). The LBOH may suggest that the holders of food implicated in single case incidents locate a private laboratory that will test food, or store the food in their freezer for a period of time in case additional reports are received. However, a single, confirmed case with leftover food consumed within the incubation period may be considered for testing.

Note: A national or regional recall of a food product for *Listeria* contamination often initiates a desire by consumers to have implicated food samples tested for contamination. The SLI will perform such testing on a case-by-case basis (*e.g.*, high-risk individual such as a pregnant woman). Requests for testing should be directed to the Division of Food and Drugs at (617) 983-6712.

Personal Preventive Measures/Education
To avoid infection with *Listeria*:

- Thoroughly cook all meat, including hot dogs, and thoroughly reheat food until steaming hot.
- Wash all raw vegetables. Avoid raw (unpasteurized) milk or foods made from raw milk.
- Avoid contamination of cooked or ready-to-eat foods by raw meats or unwashed vegetables.
- Wash hands, knives, and cutting boards after handling uncooked foods.

In addition, individuals at high risk for developing listeriosis (*e.g.*, pregnant women or immunocompromised persons, including individuals taking steroids) should:

- Avoid soft cheeses. (Hard cheeses, processed cheeses, cream cheese, cottage cheese, and yogurt need not be avoided.)
- Cook hot dogs and other ready-to-eat meats (such as sliced deli meat and prepackaged cold cuts) before eating.

A *Listeria Public Health Fact Sheet* can be obtained from the Division of Epidemiology and Immunization or through the MDPH web site at <http://www.state.ma.us/dph/>. Click on the "Publications" link and scroll down to the Fact Sheets section.

ADDITIONAL INFORMATION

The formal CDC surveillance case definition for listeriosis is the same as the criteria outlined in Section 2) A of this chapter. (CDC case definitions are used by the state health department and CDC to maintain uniform standards for national reporting.) When reporting to the MDPH, always refer to Section 2) A.

REFERENCES

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